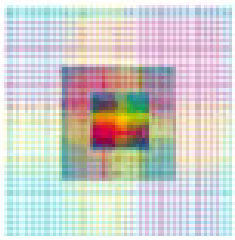

AUDIT II

Country Report
THE NETHERLANDS

Kari Aamodt Espegren
Final Report 06.05.2002
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SUMMARY OF ENERGY AUDITS

During the international climate conference in Kyoto (1997), the Netherlands committed itself to reducing greenhouse gases by 6 %. This represents 50 megatons of CO2 equivalents during the period 2008 to 2012 with respect to autonomous growth. The Kyoto-commitment is the basis for activities and programmes both with regard to energy efficiency and environment.

The Dutch governments goal of improving energy efficiency is 33% of total energy consumption in the Netherlands by 2020 compared with 1995. A lot of effort will be spent to be able to reach this goal. The Dutch government has already taken a number of initiatives to intensify energy saving and environmental policies.

The Energy Conservation Action Programme was presented in 1999, for the period 1999-2002. The Energy Conservation White Paper (1998), the Tax Plan (1999) and the Action Programme on Climate Change Policy (1999) form the framework for the Energy Conservation Action Programme. The Energy Conservation White Paper reviews the opportunities to intensify energy conservation policy in the years to 2010. In line with this, the Tax Plan includes plans to introduce an increase in the Regulatory Energy Tax in three steps, and the related tax incentives to encourage energy conservation**.**

The Energy Conservation White Paper reviewed the opportunities to increase the 1.6 % per year energy-efficiency target set in the Third White Paper on Energy Policy to between 2.0 % and 2.1 % per year for the period until 2010. This would allow for a reduction in CO_2 emissions by some 10 Mtons. The additional energy conservation measures would therefore contribute about one fifth of the Dutch Kyoto target for the reduction of greenhouse gas emissions.

Energy Audit Programmes

EMA Programme

The Energy and Environmental Advice (EMA program) was finalised in 2000. At the moment the last 72 projects are finalised.

The EMA programme was an individual Energy Audit Support Programme. EMA was also a commonly used Energy Audit Model within the Long Term Agreements. The goal of the EMA programme was to stimulate all companies and organisations with residency in the Netherlands to make a systematic and complete research of measures leading to energy savings and less environmental pollution.

The target group was all small and medium-sized enterprises (SMEs), governmental and non-profit organisations. The SME's have special attention as they often lack know-how and financial possibilities. All small and medium sized companies could apply for support to undertake an EMA audit on a voluntary basis. The audit had to be carried out by an external independent advisor, and the maximum support was 50 % of the costs, with a maximum of 7.500,- EUR (50 % for energy, and 50 % for environmental advice). A company or an organisation could apply for subsidy several times.

Senter has been the operating agent of the EMA-programme since1998.

Other Programmes with Energy Audits

Long Term Agreements

Since 1992 long-term agreements (LTAs) on energy conservation have been concluded with industry and miscellaneous other sectors as commercial and non-profit service providers, energy conversion and agriculture. LTAs are voluntary agreements between the Ministry of Economic Affairs and a particular business sector regarding efforts to improve energy efficiency within the Netherlands.

LTA I
In the first long-term agreements (LTA I), the business sectors voluntarily agreed on improving energy efficiency with 20 % within 2000. Since 1992 long-term agreements have been signed with 31 sectors of industry and ten sectors in the services sector to improve energy efficiency.

The agreement was based on an analysis of the realistic energy savings that could be achieved, as well as the technological developments that were expected in that particular sector. The sector specified which new techniques which could be introduced and which existing techniques would be improved.

The most commonly used energy audit models within the Long Term Agreements are the audit model within the EMA programme and the Energy Potential Scan (EPS). EPS is developed by Philips Electronics.

In principle all LTA I should be finished by 2000, but there are still agreements running, mainly in the services sectors. Some agreements within the LTA I will not be terminated before 2010, for instance the Railways and supermarkets.

The LTA I have been followed up by the LTA II.

LTA II
In 1999 the Dutch government introduced a new long-term agreement scheme. The LTA II is divided in two different agreements.

- For the large companies, the agreement is called the Energy Efficiency Benchmarking Covenant. On 6 July 1999, the Dutch government concluded the Energy Efficiency Benchmarking Covenant with industry. In it, the energy-intensive industry pledges to be among the world leaders in terms of energy efficiency for processing installations by no later than 2012.
- For the medium-sized companies, the agreement was signed on 6 December 2001 with 15 industrial sectors. In addition at least five other sectors are expected to sign the agreement during 2002.

In exchange for these undertakings, the government has agreed not to impose any extra specific national measures governing energy conservation or CO_2 reduction on the participating companies.

Both LTAs focus on accomplishment of the measures identified in the energy audit.

Energy Performance Advice

Energy Performance Advice (EPA) is a support scheme for private homes. Homeowners of a home built before 1998 can apply for an EPA, starting by approaching a local EPA adviser. The adviser will pay a visit and see what energy-saving measures are to be taken. The advice is without obligation. If the homeowner decides not to implement any measures, there will be a charge for the advice.

An EPA consists of different elements. First the EPA adviser determines the energy use of a home. Then the advisor determines which energy-saving measures are possible; for example additional insulation, double-glazing or a new high efficiency boiler. In addition, the adviser will work out what the costs are and give an idea of the availability of subsidies.

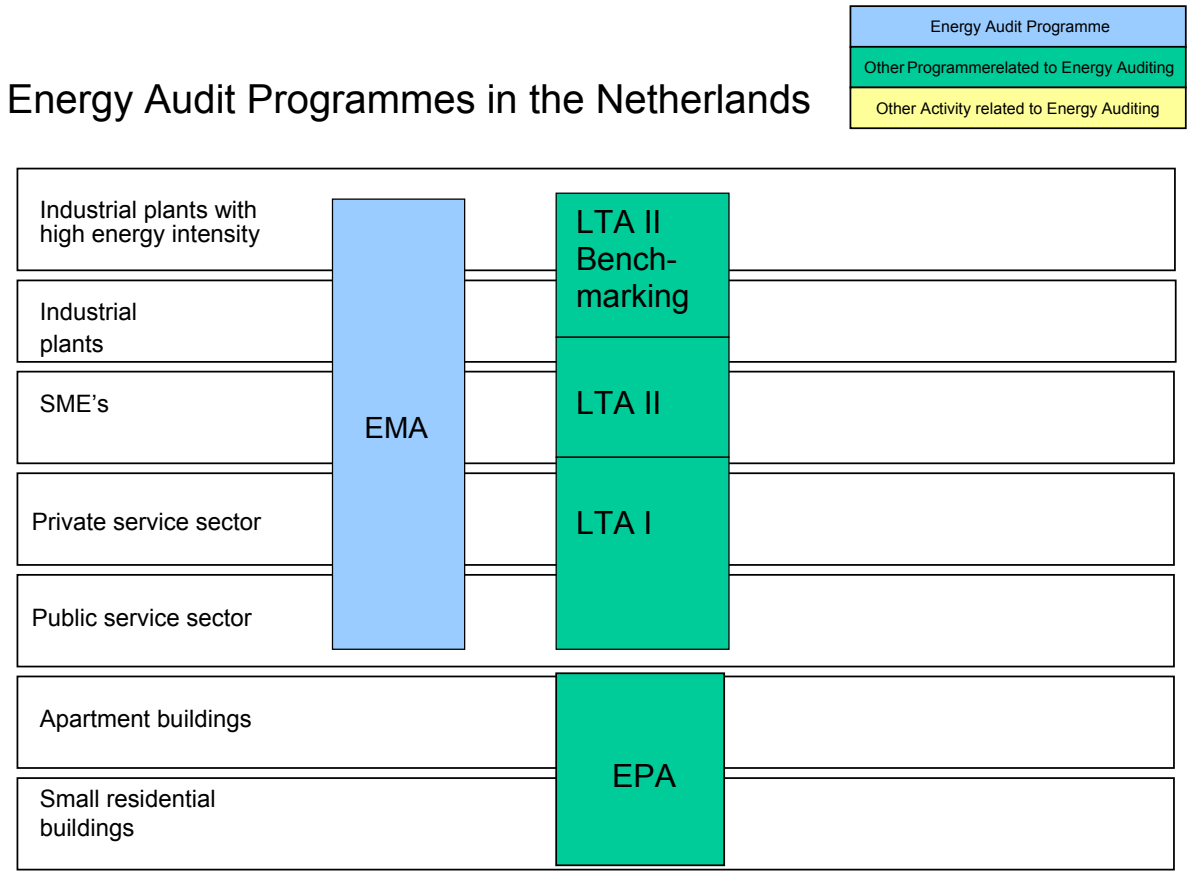

Table of EAP features coverage

	EMA	LTA
Status	Finalising phase	1992 -
Administration	Senter	Novem
EA models	++	++
Auditors' tools	++	++
Training, authorisation	++	++
Quality control	++	+++
Monitoring	++	+++
Volumes, results	+++	+++
Evaluation	+	+++

+++ = Detailed information available
++ = Some information available
+ = Very little information available
= No information available / does not exist

Contacts

Long Term Agreement	Meindert Booij	Novem P.O. Box 8242 NL-3503 RE UTRECHT	+030 - 2393417	m.booij@novem.fi www.novem.nl
EMA	Corry van Driel	Senter P.O Box 30732 NL-2500 GS Den Haag	+31 70 3610167	C.vanDriel@senter.nl www.senter.nl

Country Report

Country Report written by	Kari Aamodt Espegren	IFE
Based on the interviews of	Meindert Booij	Novem
	Corry van Driel	Senter
Information gathered	November 2001 – January 2002	

Disclaimer

THE COUNTRY REPORT

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1 Background and Present National Policy

1.1 Previous activities

Since 1992, long-term agreements (LTAs) on energy conservation have been concluded with industry and miscellaneous other sectors such as commercial and non-profit service providers, the energy conversion industry and agriculture. LTAs are voluntary agreements between the Ministry of Economic Affairs and a particular business sector regarding efforts to improve energy efficiency.

In the first long-term agreement (LTA I) the business sectors voluntarily agreed on improving energy efficiency by a 20 % within 2000. Since 1992 such long-term agreements have been signed with 31 sectors of industry and ten sectors in the built environment to improve energy efficiency. The goal of improving energy efficiency have been achieved within all sectors.

The agreement was based on an analysis of the realistic energy savings that could be achieved, as well as the technological developments that are expected in that particular sector. The sector specified which new techniques that would be introduced and which existing techniques that could be improved.

The most commonly used energy audit models within the long-term agreements, was the audit model in the EMA programme and the Energy Potential Scan (EPS) developed by Phillips Electronics.

The objective of energy conservation policy in the Netherlands is to secure a far-reaching improvement in energy efficiency without a negative effect on economic growth and the competitiveness of Dutch business. The long-term agreements (LTAs) represent the key instrument in meeting this objective. The parties to an LTA are the Minister of Economic Affairs, a branch organisation and usually also the Association of Provincial Authorities. Individual companies join the LTA by signing a letter of accession.

In order to conclude an LTA I, a sector had to meet a number of conditions:
- the sector should be homogeneous, both in terms of process and in terms of product;
- the energy consumption level of the sector must exceed 1 PJ;
- the energy consumption of the participating companies must account for at least 80 % of the total energy consumption of the sector;
- the branch organisation must be well-organised, in other words have good contacts with its members and be able to provide its members with information effectively;
- the branch organisation must demonstrate a commitment to actively stimulating the implementation of the LTAs.

1.2 Present national policy

The Dutch government has recently taken a number of initiatives to intensify energy-saving and environmental policies. For example, the CO_2 reduction plan, the Sustainable Construction action plan, the Energy Conservation Action Programme and the Third White

Paper on Energy Policy were published. Many of the measures and policies included in these plans and programmes have already been realised. The environmental issue has also been given high priority, such as in the 4th National Environmental Plan, which was published in 2000.

The Energy Conservation Action Programme 1999-2002
The Energy Conservation Action Programme 1999-2002 describes the contribution to energy conservation that the Cabinet expects from the various public sectors and other target groups in the 1999 – 2002 period. The Action Programme also describes the government instruments that will be deployed for this purpose. The following three policy documents form the framework for the Action Porgramme:
- The Energy Conservation White Paper (1998)
- The Tax Plan (1999)
- The Action programme on Climate Change Policy (1999)

The Energy Conservation Action Programme covers all aspects of energy conservation.

The Energy Conservation White Paper that was presented to the Second Chamber of Parliament in 1998 reviewed the opportunities for intensifying energy conservation policy. Clearly, it is difficult to conserve energy at a time when energy prices are low. This can only succeed through joint action by the government and the public sectors. The Energy Conservation Action Programme is designed to provide an incentive for this.

Actions to improve energy efficiency are developed along three lines in the Energy Conservation Action Programme:
- actions that specifically address end-users
- a clear allocation of responsibilities within central government
- a key role for intermediate organisations

The government deploys general instruments for the different groups of end-users on the level of financial incentives for energy conservation investments. A limited number of key policy instruments are also deployed for each group. For the energy-intensive sectors that have to compete on an international level, these involve the new covenant approach; benchmarking and long-term agreements on energy efficiency. The key policy instruments for the other sectors are mainly taxes, advice and regulation.

All ministries are responsible for acheiving the energy conservation targets in their own policy areas. Special attention will be paid to monitoring the Energy Conservation Action Programme, in order to keep track of the progress made and to enable the measures to be adjusted as necessary.

The Dutch government want to conserve energy for a variety of reasons. It benefits the environment, the economy and security of energy supplies in the future. With reduced consumption of fossil fuels, less CO_2, NOx and SO_2 are released into environment. These substances contribute the greenhouse effect and acidification of the environment. There are also economic benefits. Private consumers and companies can save money by conserving energy. New energy conservation technologies offer commercial opportunities for the supply industry. Energy conservation also makes society as a whole less dependent on the supply of energy.

1.3 Organisation

Novem
Novem is the Netherlands agency for energy and the environment and is a not-for-profit organisation, which provides support to the government with regard to the preparation of policies. Novem is an implementation organisation in the field of sustainable development.
Novem:

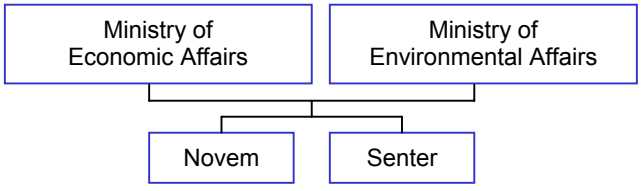
- translates government policies into concrete programmes, projects and activities with various target groups;
- stimulates and supervises technological cooperation;
- provides for adequate exchange of knowledge and information;
- brings foreign knowledge to the Netherlands and vice versa;
- executes subsidy schemes;
- carries out activities in support of policy preparation and provides consultancy services for authorities.

In 2002 Novem will become a government agency. This will not influence on the activities and programmes organised by Novem. Novem has a permanent staff of about 450.

Senter
Senter is an agency of the Ministry of Economic Affairs that implements government policy in the fields of technology, energy, environment, exports and international co-operation. Its objective is to make an enduring contribution to the position of the business sector and knowledge institutions in the Netherlands. Senter is dedicated to implementing tax reduction schemes, subsidy schemes, credit schemes and other programs in the field of technological research and development, energy saving, environment and international co-operation. Senter provides industry and other target groups yearly with 1 billion EUR of support. Senter has a staff of about 500 employees; partly permanent, partly temporary (60 %-40 %).

The Minister of Economic Affairs provides financial support to stimulate energy conservation. Senter organises various schemes to subsidise energy conservation projects and energy audits. Among the more important are the Energy and Environment Advice (EMA), Subsidies for Energy Programmes Decree (BSE), the Tenders for Industrial Energy Conservation (TIEB), the subsidy scheme for Energy Conservation and Environmental Advice and the Long-term programme for Intersectoral Technologies (MINT). In addition, the Energy Investment Tax Relief Scheme (EIA) also applied from 1997.

The key players and the administration of the energy audit programmes in the Netherlands:



2 Energy Audit Programmes

2.1 EMA Programme

The EMA programme (Energy and Environmental Advice) has been a part of a bigger programme called "'Cleaner Production". The Cleaner Production programme is carried out as a collaborating activity between the departments of Economic Affairs and Environmental Affairs and the provincial authorities.

The Cleaner Production Programme provides an integrated approach to the environmental problem. Not only because this offers entrepreneurs a point of address, but also because it gives the best possible advice to business about the options inherent in commercially responsible environmental measures.
This integrated approach centres on five environmental themes:

- Environmental technology,
- Prevention of waste and emissions,
- Environmentally friendly product development,
- Energy conservation,
- Internal corporate environmental protection.

The EMA program is an Energy Audit Support Programme which in principle was terminated in 2000. At the moment the last 72 projects are finalised. How ever, the way of accomplishing energy audits within the EMA programme has been very important for other programmes and activites including energy audits in the Netherlands.
The EMA programme had two main elements:

- The first element is a campaign targeting intermediaries that may play a role in assessing energy and environmental aspects within small companies, and to bring up the subject in their contacts with small and medium sized enterprises.

- Secondly, if there is interest then the next element is supporting a feasibility study that includes certain measures and technologies. This part is in the form of an audit combined with advice for selected measures, with a relative short pay back time, like energy saving, lighting schemes, waste separation etc.

A lot of SMEs show signs of being tired of broad and detailed audits. They want to focus more directly on certain problems and certain solutions. Furthermore, there are several regional competitors of the EMA-scheme, which offer better conditions (i.e. "no cure no pay" contracts).

2.1.1 Goals

The goal of the EMA programme was to stimulate small and medium-sized companies and non-profit organisations with residency in the Netherlands to make a systematic and complete research of measures leading to energy savings and less environmental pollution.

2.1.2 Target sectors

The Cleaner Production Programme is geared towards advisors to small and medium-sized enterprises (SMEs), such as Chambers of Commerce, corporate environmental services, commercial environmental consultancies, financial advisors, professional and branch-related organisations, prevention teams, and provincial and municipal authorities. The Cleaner Production Programme also targets the SMEs themselves.

2.1.3 Administration

Senter was the operating agent for the EMA programme in the period 1998-2000
In the period 1998-2000 the EMA program was aimed at SME and not longer directly connected to LTA agreements. In this period Senter received 1217 applications. Altogether a subsidy of 50% was given for 1028 objects. The recipients were about 780 SME and a minority of universities, schools and municipal institutions.
All applicants had to fill out a form with questions about their company/organisation, the object to be examined and the external advisor they hire. They also have to include a copy of the offer from the advisor.

Senter realised the importance of a quick response on the application. Senter used therefore a simple but efficient application procedure. It gave them the opportunity to give a definite answer within three weeks after the application form arrived in their office.

After the advisor carried out his audit the applicant has to send a copy of it to Senter including an invoice and a proof of payment. Again within a few weeks the applicant received the money from Senter.

2.1.4 Implementing instruments

The government has supported energy audits within the EMA programme up to 2000. The audit had to be carried out by an external independent advisor, and the maximum support was 50 % of the costs, with a maximum of 7.500,- EUR (50 % for energy, and 50 % for environmental advice). A company or an organisation could apply for subsidy several times.

To stimulate the actual implementation of the advices by means of investments, the Netherlands government have decided to join the EMA with an Energy Investment Instrument (EIA, energie investeringsaftrek regeling). This fiscal instrument enables entrepreneurs to deduct energy investments from taxes. In 2001/2002 and later on it is also possible to include the costs of an energy advice in these investments. Similar instruments for energy investments in the non-profit sector (EINP) and for environmental investments (MIA) do exist, and are implemented by Senter. The reason for not having a separate energy audit programme in the Netherlands is the focus on implementation of energy efficiency measures. By integrating the energy audits in the Tax Relief Scheme, the government expects to achieve more accomplished measures in companies and organisations with residency in the Netherlands.

Energy audits accomplished with the same model/procedure also meet the criteria that are used by the government to give permits under the environmental laws. The integration of energy and environmental performance gets more and more important because of growing legislation on environmental topics, for instance a penalty if the normal waste is polluted with small amounts of chemicals. The local authorities are continuously trying to push SMEs to improve in this area, and one recent measure in this respect is the requirement for every company to have an environmental license. If there are certain measures necessary in order to achieve the license, the authorities accept the energy and environmental audit as a planning scheme for the investments, and the license is given under the condition that the advice is carried out within a certain time limit.

Mandatory / legal schemes	**Voluntary schemes**
Links to environmental legal schemes	Energy audits are voluntary
Fiscal incentives (taxes)	**Fiscal incentives (subsidies)**
Energy investments and energy audits give deduction from taxes	The EMA programme gave subsidies up to 50% for consulting, max 7.500 EUR
Marketing tools	**Policy issues**
Internet, leaflets, brochures	It is a policy issue to be less dependent on the supply of energy. Audits are used as an important tool to achieve energy savings and reduced pollution.

2.1.5 Energy Audit Models

The following general procedure (model) is used in accomplishment of energy audits:

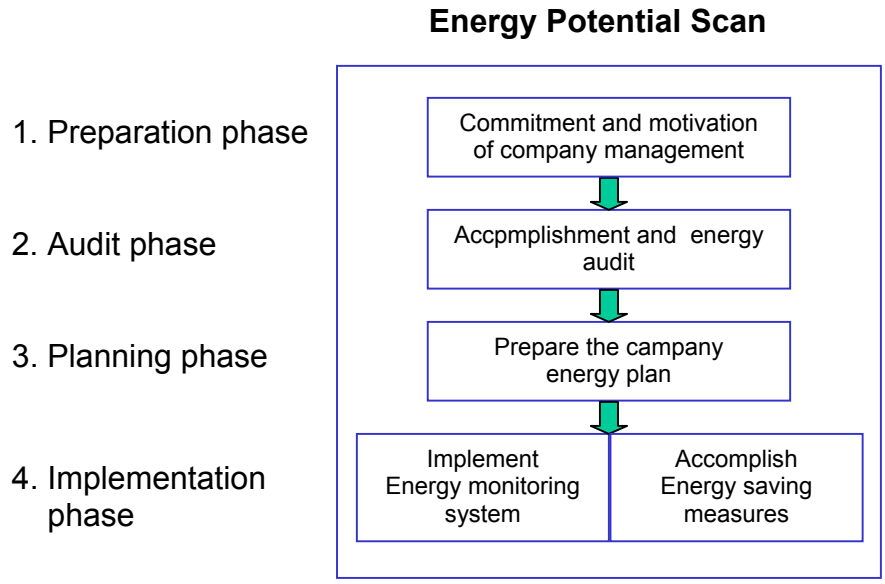
- Make a description of the object that is audited: What activities take place, what products are being produced, working times etc.
- Divide the production process is into clearly separated steps.
- Give an overview of the in- and outgoing streams (raw materials, additives, energy, water, waste, emissions etc.) for every step in the process.
- This leads to an overview of the energy- and environmental situation of the object in question. This is done for each relevant part of the object.
- Make a detailed list of possible measures that can be taken to handle the problems, which arise from the actual energy and environmental situation and the costs of the necessary investments.
- Furthermore, give insight in the payback time of the investments.
- Finally, the advice shall contain information about possibilities of subsidies etc.

2.1.6 Auditors' tools

The **Energy Potential Scan** (EPS) is both a procedure (audit model) and a tool for the calculation and assessment of energy saving measures.

EPS is an investigation method that was developed by order of Novem at Philips and that has been applied in almost all industry sectors in the Netherlands. The core of the EPS is

that the consultant accompanies the company in the making of an energy conservation plan. The EPS not only gives technical but also organisational possibilities for improvement. In most cases after the EPS a project for the introduction of energy care follows.



The diagram shows the different phases and tasks in the Energy Potential Scan

The main reason to develop the inventory method EPS was to get a better basis for the execution of conservation options. For the development of the EPS, but valid for every inventory method, the following requirements were formulated:

- **Structure**
  Develop tools with which a logical order of the investigations is given.
- **More than known techniques**
  Besides investigations whether known and already developed techniques are applicable, develop a tool with which, in particular, production processes can be investigated for special conservation options.
- **Create broad support**
  Structure the execution in such a way that after the investigation sufficient support is present in the organisation for further execution and realisation of the energy conservation options found and the energy care improvement options.
- **Committing the management**
  Commitment of the management in the execution and the broad support creating should provide a result that the management cannot dismiss.

The starting points in the execution of requirements in EPS, but also in energy care implementation are:

- **A participating consultancy model**
  This means that the consultant is an expert, but does not behave as such. Optimum participation of the company workers satisfies the creation of broad support. The consultant should supervise the sufficient involvement of the employees, also on the shop floor.

- **The basis is the function E = Q x A**
  In this formula E is the effect of an activity, Q the quality of the activity and A the acceptance of the activity in the organisation. This acceptance should be realised through the creation of broad support. In many cases insufficient attention is being paid to the element A of the function. Quality itself turns out to be insufficient for a good result. A good equilibrium between quality and acceptance is very important.
- **Broad support**
  Broad support and the resulting acceptance is especially obtained through doing-things-yourself. Hence the task of the consultant is mainly supporting.
- **The execution of the investigation**
  The execution of the investigation should be organised mainly by the organisation itself. The instrument is an Energy Action Team. The composition of this team is of essential importance for the success of the investigation. Especially in the orientation phase in the talks with the management it is important to pay attention to this aspect. It is of great importance that employees that have the responsibility and authority with respect to the energy consumption are present in the Energy Action Team. In particular, production departments should be well represented. During the execution of the investigations knowledge and expertise of the employees in the departments and on the shop floor should be used when needed. Preferably a member of the management team that has the responsibility for production chairs the team.

The result of an EPS is the energy conservation potential divided in three categories:
1. Technology and low investment
2. Technology and high investment
3. To be developed technology

	Categories of feasibility		
Pay Back Time	**A**	**B**	**C**
0 – 2 years			
2 –5 years			
> 5 years			

A = technology is available, feasibility is certain
B = technology is available, feasibility is uncertain
C = technology not available at this moment, feasibility is uncertain

2.1.7 Auditing volumes

In the period 1998-2000 Senter received 1217 applications to the EMA programme. Altogether a subsidy of 50% was given for 1028 objects. The recipients were about 780 SME and a minority of universities, schools and municipal institutions. Per object a maximum grant of 3.403 EUR could be received and for a combined project (energy and environmental advice) the maximum grant was 6.807 EUR.

2.1.8 Results

The average costs per energy audit were 5.862 EUR. The average amount of subsidy per project was 2.716 EUR.

The average energy saving potential per energy audit was 41.000 kWh and 28.800 m3 of natural gas.

2.1.9 Training and authorisation and quality control

Within the EMA programme only authorised consultants could be contracted for the audits. The authorisation implied that relevant information with regard to experience, competence etc. was gathered on new consultants and auditors before they could join the scheme.

Chapter 3.1.9 gives an overview of different training courses with regard to energy audits.

2.1.10 Monitoring

SENTER monitors the EMA programme, and the monitoring frequency is on a monthly basis for information on the amount of applications and on a half-year basis for the output of the reports of the audits with a dedicated advice. Every half a year all reports are analysed for certain information about the possible energy-reduction, environmental reduction, the cost-reduction and the breakeven-time of the advised investments. The types of measures are monitored too. A breakdown is made to different branches of industry.

2.1.11 Evaluation

The EMA program has not been evaluated so far.

However the general impression was that the EMA program was relatively successful and that also a lot of parties from the non-profit sector were interested in the program too.

2.1.12 Observations and Future Plans

To stimulate the actual implementation of the advices by means of investments, the Netherlands government decided to join the EMA with an Energy Investment Instrument (EIA, energie investeringsaftrek regeling). This fiscal instrument enables entrepreneurs to deduct energy investments from taxes. From 2001 it is also possible to include the costs of an energy advice in these investments. Similar instruments for energy investments in the non-profit sector (EINP) and for environmental investments (MIA) do exist and are implemented by Senter.

3 Other Programmes with Energy Audits

3.1 Long Term Agreements

LTA I
As part of energy conservation policy, since 1992 long-term agreements (LTAs) on energy conservation have been concluded with industry and other sectors (commercial and non-profit service providers, energy conversion and agriculture). The first generation agreements were voluntary agreements between the Ministry of Economic Affairs and a particular business sector regarding efforts to improve energy efficiency by a specific percentage within an agreed period. In total 31 LTAs was concluded with industry and ten with other sectors. Only one LTA in industry did not finish in 2000. The LTA in the cacao sector will run until the beginning of 2005. In the service sector some agreements will not be terminated before 2010, for instance the railways and the supermarkets.

Prior to the conclusion of an LTA with a sector, an exploratory survey of the possibilities for conservation and the associated potential is conducted. This survey can be regarded as an energy audit for the sector. The survey can cover both organisational (good housekeeping and energy management) and technical measures. The results of this investigation form the input for fixing a quantified energy conservation target for the sector as a whole. A long-term plan sets out how the target can be achieved by the sector as a whole. An overview of the energy conservation options is distilled from the inventory. In addition, the LTA includes obligations for individual companies, such as formulating and implementing an energy conservation plan (ECP) and the annual monitoring of energy consumption, expressed in the Energy Efficiency Index (EEI).

LTA II
The LTA II is divided in two different agreements. For the medium-sized companies the agreement was signed on 6 December 2001 with 15 industrial sectors. In addition five other sectors will sign the agreement during 2002. The agreements concluded within the LTA II are in many ways similar to the agreements within the LTA I. However, a new element in the agreements is the commitment of carrying out all measures with earning ability of 5 years or less. In addition, the LTA II companies must annually fill in a checklist regarding improvements in energy management and reach a certain level within two years after entering LTA II.

For the large companies the agreement is called the Energy Efficiency Benchmarking Covenant. On 6 July 1999, the Dutch government concluded the Energy Efficiency Benchmarking Covenant with industry. In it, the energy-intensive industry pledges to be among the world leaders in terms of energy efficiency for processing installations by no later than 2012.

In exchange for these undertakings, the government has agreed not to impose any extra specific national measures governing energy conservation or CO_2 reduction on the participating companies.

3.1.1 Programme goals

The medium-sized companies that conclude the LTA II agree to improve their energy efficiency. This shall be achieved through the implementation of energy management in the companies and by the introduction of energy efficiency measures with a pay back time of 5 years or less. This results in a target for each company. Every branch organisation writes a Multi Year Program 2001 – 2004.

Energy intensive companies taking part in the Benchmarking covenant enter into a highly ambitious undertaking: they pledge to be among the world leaders in energy efficiency by no later than 2012. These companies will therefore make maximum efforts to consume energy more efficiently, yet without compromising their international competitiveness. After all, they need go no further with the measures they take than their best global competitors.

3.1.2 Target sectors of the LTA II

The target sectors of the LTA II are the following:

- Large and energy intensive industrial and energy conversion companies for benchmarking
- Medium-sized companies; both industry and in a later stage possibly other sectors: commercial and non-profit service providers, and agriculture.

3.1.3 Administration

Effective supervision is crucial for the implementation of the covenant.

The Benchmarking Committee is responsible for overall implementation. This Committee contains representatives of all the participating players. The Committee discusses a wide range of general bottlenecks, monitors the progress of the covenant and reports on this to the ministers responsible.
For LTA II of the medium-sized companies the LTA II platform will be formed with comparable authority. On the sector level, the Consultative Group on Energy conservation - consisting of the government and the branch organisation involved - carries out the tasks mentioned above.

The Benchmarking Verification Bureau has been specially established to monitor the practical aspects of the covenant. This independent bureau verifies for each company all the different stages in the benchmark process. For example, the bureau checks whether the definition of the world lead is adequately underpinned and whether the energy efficiency plans have been properly put together. The bureau also issues advice on this to the participating company and to the competent authority.
Novem - within the framework of the program LTA facilitation of the Ministries of Economic Affairs and Agriculture, Nature Management and Fisheries - has a comparable role in the LTA II for the medium sized companies. It also checks whether the energy efficiency plans have been properly put together. It also issues advice on this to the participating company and to the competent authority. It advises the ministries on the sector multiyearplans. Besides, it governs the admission of companies and sectors to the LTA.

Besides the administrative aspects (see also 3.1.10 Monitoring) Novem promotes energy conservation in the medium sized companies through process technology and organisational measures, but also through integrated chain management, dematerialisation, sustainable industrial estates and renewable energy.

The appropriate authority will evaluate the energy efficiency plan. Once it has been approved, it will be incorporated into the environmental license. This plan must be reviewed every four years, when the world lead is redefined.

3.1.4 Implementing Instruments

The LTA is an implementing instrument for the energy audit. Companies signing the LTA commit to accomplishing an audit. Novem is charged with executive responsibility for preparing and advising on the LTAs.

The Minister of Economic Affairs provides financial support to stimulate energy conservation. Senter organises various schemes to subsidise energy conservation projects and energy audits. Among the more important are the CO_2 Reduction Plan and Energy Conservation through Innovation. In addition, the Energy Investment Tax Relief Scheme applied from 1997.

When signing the LTA II it is compulsory to implement "Energy Care" within two years. Energy Care is similar to Energy Management and is based on the following structural method:

- Phase 1: Orientation
- Phase 2: Analysis / Audit
- Phase 3: Planning
- Phase 4: Implementation

Mandatory / legal schemes	**Voluntary schemes**
Energy audits are mandatory when signing the LTA	
Fiscal incentives (taxes)	**Fiscal incentives (subsidies)**
Tax relief schemes	Up to 100 % subsidies for accomplishing an energy conservation action plan. The subsidy scheme are open for all companies, whether in LTA or not.
Marketing tools	**Policy issues**
Close cooperation with industrial branch organisations gives a marketing advantage. - Internet, pamphlets	It is a policy issue to be less dependent on the supply of energy. LTAs are includes in the Dutch national environmental plan. LTA companies receive environmental permit.

3.1.5 Energy Audit Models

A commonly used Energy Audit Model within the Long Term Agreements, was the model on which the EMA programme is based. This model is described in chapter 2.1.5

An important part of the audit within the LTA is to assist the company in writing an energy conservation plan (ECP). The ECP consists of the following elements:
- a description of energy consumption in the reference year and the current year;
- the energy efficiency target of the company;
- an indication of possible activities;
- an estimated timetable of activities;
- the method by which the Energy Efficiency Index is determined;
- the method of reporting.

3.1.6 Auditors' tools

EPS (Energy Potential Scan) is a tool for advisors developed by Philips Electronics. See chapter 2.1.6 for more information.

3.1.7 Auditing volumes

LTA Is in the industrial sector
Around 1.100 companies and dozens of branch organisations and commodity boards signed up for the industrial LTA I. Signing the LTA, implies you have to carry out an energy audit.

Energy audits have been carried out in all the LTA-companies.

The energy consumption in these companies is 521 PJ, or about 90% of total industrial energy consumption.

LTAs in other sectors
In addition to the LTAs with industrial sectors, LTAs have also been concluded in other sectors, including commercial services, the non-profit sector, the agricultural sector and the energy conversion companies. With the exception of the LTA for greenhouse horticulture, these agreements are also concluded with individual companies or institutions.

Approximately 30% of total energy consumption in the utilities building sector is covered by long-term agreements.

In the "energy conversion companies" category, two LTAs have been concluded: one with oil refineries in 1995 and the other with oil and gas producers in 1996. The combined energy consumption of these sectors is 197 PJ.

LTAs on energy conservation with industrial organisations in the transport sector are of importance, and a LTA with Netherlands Railways, both the utilisation of buildings and the transport function, have been concluded.

In total, 1.000 long-term agreements have been signed up in other sectors.

LTA II
So far approximately 90 % of all energy intensive industrial companies have signed up the LTA II Benchmarking. Large companies from the following industrial sectors participates:

- Beer (breweries)
- Cement
- Ceramics
- Chemical
- Iron and steel
- Non-Ferro
- Oil refineries
- Philips
- Power generation
- Pulp and Paper
- Sugar
  and a single large company from other sectors like textiles and rubber.

All the other industrial sectors from LTA I will most likely sign up LTA II.

3.1.8 Results

LTA I
The aim of the LTA I was to improve energy efficiency by an average of 20% in industry by the year 2000, and at later dates 25- 30% in commercial and industrial buildings and 26% in the agriculture sector, all relative to 1989 levels. These figures relate to energy consumption per physical unit of product. Consumption for non-energy purposes is not a factor. This means that a higher level of energy consumption resulting from economic growth or a switch in production to more energy-intensive sectors of industry and products does not influence the energy efficiency level. The goals of the LTA I were achieved in industry.

LTA II
There are no results from the LTA II so far. The first results will be available from 2002.

3.1.9 Training, authorisation and quality control

There are no formal training or authorisation of the energy auditors operating within the LTAs.

Each year, the Cleaner Production Programme organises an Advisors' Day for advisors to the SME sector. This conference is an opportunity for exchanging knowledge and experience and for establishing contacts with fellow advisors about environmentally friendly activities in the SME sector. Attendance to the Advisors' Day is voluntary and free of charge.

In addition, the Organisation for Energy Advisors (OvEA) organises different training courses for energy auditors/advisors. Mainly, these are two-day courses. Items covered in the different courses are energy audits in general, energy potential scan, renewable energy sources in industry and implementation of energy measures. Participation in all training courses is voluntary.

The following training courses are arranged regularly:

- Advice proficiency 1 (EPS 1)
- Energy Potential Scan (EPS 2)
- Water Scan (EPS 3)
- Renewable Scan Industry (EPS 4)
- Advice proficiency 2 (EPS 5)
- Organisation and Technology (EZ 1)
- Implementation (EZ 2)

The energy audit reports within the LTAs are controlled by Novem or by the provincial technical department.

3.1.10 Monitoring

The progress of the LTA I was monitored annually. In the same way, the progress and the achievements of the LTA II will be monitored on an annual basis.

Monitoring of LTA I
Within the LTA I every company prepared a confidential Energy Conservation Plan (ECP), which was regularly evaluated and summarised for the purposes of a request for a permit in the (public) Corporate Energy Plan (CEP). Each company's Energy Conservation Plan, monitoring reports and Energy Efficiency Index were confidential.

The licensing agency assessed whether a company met its responsibilities on the basis of the Corporate Energy Plan. The competent authority asked Novem for advice, and the question of whether or not the company concerned was complying with LTA agreement was central to the advice. Collected data were systematically controlled and tested by Novem.

Annually Novem prepared a report containing the aggregated results of the monitoring of LTA I. The report was discussed in the Consultative Group. This group consisted of representatives of the Ministry of Economic Affairs and other government bodies involved, the industrial organisation and Novem. The Consultative Group was also the forum for discussion of economic, policy and technological developments, which have a bearing on energy consumption.

The competent authority was responsible for the final assessment. The memorandum Energy in the Environmental Permit from 1999 (published by the Ministry of Economic Affairs and the Minsitry of Housing, Spatial Planning and the Environment) advised the licensing authority not to impose any further requirements if the Novem assessment was positive. The environmental permit will stipulate the investments that the company has already agreed in principle to implement, as well as a duty to report. In the event of a negative assessment by

Novem, the licensing authority can decide to follow the approach for a company that is not party to a long-term agreement.

Monitoring LTA II Benchmark

The goal of the companies is to be among the world leaders in energy efficiency. But how can they know when they have reached that level? The participating companies will have to set this level themselves, with the help of an independent consultant, by means of an international benchmark. In doing so, companies will compare their processing plants in the Netherlands with similar plants abroad. The Dutch plants will need to individually measure themselves against the average energy efficiency of the best region in de world or with the best 10 % of the globally structured installations (excluding those in the Netherlands).

The covenant is due to run until 2012. In 2004 it will be given its first evaluation. Nearly all energy intensive enterprises have signed the covenant. All these companies are now aiming to achieve a world lead in energy efficiency. Clearly, a covenant-based approach is one that appeals to Dutch industry.

Monitoring of LTA II

All medium-sized companies signing the LTA II pledge to accomplish an energy audit
The companies must also annually fill in a checklist regarding their improvements in energy management. Novem controls these checklists. The maximum points possible to achieve are 200. In two years time the companies commit to reach 50, and then they have to work further on with improvements to be specified later.

A summary of the checklist is presented in the following. The table gives the number of elements per section, the total achievable score per element and per section and the number of compulsory verification points (questions).

Table. Summary of the checklist

“Not or insufficiently demonstrable in accordance with the Reference": 0 points
"Partiallly in accordance with the Reference, but room for improvement": 1 point
"Completely in accordance with the Reference": 2 points

Nr.	*Reference element*	*Max. points*	*Number of compulsory questions*	*Points*
1	**Energy policy**			
1.1	Energy policy statement	12	3	6
2	**Planning**			
2.1	Energy aspects	26	6	12
2.2	Legal and other obligations	10	2	4
2.3	Targets and duties	16	6	12
2.4	Energy care programme	12	4	8
3	**Implementation and execution**			
3.1	Structure and responsibilities	10	4	8
3.2	Education and creating awareness	8	2	4
3.3	Communication	12	1	2
3.4	Documentation energy care system	6	1	2
3.5	Document management	14	2	4
3.6	Control of the activities	10	2	4
4	**Control and correcting measures**			
4.1	Control and measurements	12	4	8
4.2	Deviations, correcting and preventive measures	10	3	6
4.3	Registrations	20	3	6
4.4	Energy care audits	14	6	12
5	**Commitment of the management**			
5.1	Evaluation	8	2	4
	Total	**200**	**51**	**102**

Table. Summary of the checklist

3.1.11 Evaluation of audits within the long-term agreements

The paper "Long term agreements on energy efficiency - Results LTA I till 2000" reviews the progress made with the long term agreements on energy conservation up to and including 2000. It deals with the overall improvements achieved in energy efficiency in general and improvements within individual sectors.

The audit is a very important element in the LTA. However, Dutch companies need the LTA framework as a motivation and impetus to carry out initiatives and measures described in the audit report.

The University of Utrecht evaluated the Long Term Agreements in 1997. The university investigated a representative number of sectors with both high and low energy consumption levels, as well as sectors with relatively good and poor results. The results of the study were positive, as the following observations demonstrate:

- LTAs make a demonstrably significant contribution to generating improvements in energy efficiency, almost doubling the results that would be achieved without LTAs.
- Investments in conservation, good housekeeping and energy management are to a large extent realised through the LTAs.
- When replacement investments are being considered the possibilities for conservation are studied.
- In sectors where energy is an important production factor, energy costs are an important consideration.
- The LTAs provide a better structure for existing energy activities, and a platform for consultation with the government on energy conservation was created.
- The LTAs in less energy-intensive sectors ensure that the subject of energy is placed on the agenda, both on the shop floor but especially at management level.
- The information gap with respect to conservation options has been largely filled.
- Furthermore, joint research at a sector level is stimulated. Under intensive supervision by Novem, user groups from a number of LTA companies have been formed for specific conservation options.
- The research focuses on the potential for conservation, the costs, and the relevant technical and organisational aspects with respect to implementation within companies. The knowledge and experience acquired are passed on to other companies that are party to the LTA.

There is a limited amount of 'free rider behaviour'. This refers to companies, which have signed on a LTA but do not make an effort. Research clearly showed that companies experience the obligation to make an effort as a moral obligation to produce results. When a company has signed the LTA it wants to comply with it. Of the over 1000 companies signing on the LTA, less than 50 companies were excluded from the agreement. Exclusions were due to not fulfilling the elements in the LTA, e.g. not carry out the energy audit.

During the LTA a lot of experience was gained, and the University of Utrecht made recommendations for improving the quality. The LTA II have taken these into account, and the LTA II includes a strengthening of the Energy Conservation Plans by requesting more specific information on the measures to be taken, and to further harmonise the monitoring system. The involvement of local authorities as the licensing agency for environmental permits is increased considerably in LTA II.

3.1.12 Observations and Future Plans

It is already clear that the state-of-the-art conservation measures, which were for the most part implemented during the first generation of LTAs, have largely been exhausted. To sustain, and preferably accelerate, the current rate of improvement in energy efficiency, more complex options will have to be considered. Two approaches can be distinguished. Firstly, there is the technological approach, which involves investigating what technologies offer the prospect of a leap forward in energy efficiency within a period of 5 to 20 years. Secondly, we can distinguish a more organisational and logistical perspective, which

involves investigating how energy efficiency can be improved in the relationships between companies. Examples might include integrated chain management, dematerialisation and sustainable industrial estates.

Partly through the LTA framework, industry will have to make a substantial contribution to the goal of improving energy efficiency by 33% of total energy consumption in the Netherlands by 2020 compared with 1995. A lot of effort will be spent to be able to reach this goal.

3.2 Energy Performance Advice

Energy Performance Advice (EPA) is a support scheme for private homes. Homeowners of a home built before 1998 can apply for an EPA, starting by approaching a local EPA adviser. The adviser will pay a visit and see what energy-saving measures are to be taken. The advice is without obligation.

3.2.1 Target

EPA applies to all houses with a building licence from before 1998. In the Netherlands the market potential is something of the order of six million houses. In addition, there will be introduced an EPA for non-residential buildings as well. Advisers will have substantial scope to expand their market with EPA.

3.2.2 Administration

Novem administrates the EPA on behalf of the *Ministerie van VROM*. This ministry cover both the regional planning and the environment.

3.2.3 Implementing Instruments

Installation engineers, people working in the contracting industry or for an energy company can prepare audits within the EPS. The auditors may use the Energy Performance Advice as a sales and marketing tool. In many cases it can be used to complement the existing range of services, for example as a part of the annual service of the central heating system, in the settlement of the energy company account or in a renovation.

The advice of an EPA adviser is an additional service activity. The combination of EPA and Dutch Energy Premium means that customers can implement energy-saving measures more cheaply and more effectively. So being an EPA adviser means not only giving expert advice, but also offering lower energy costs and (additional) premiums. This leads to further improvement of comfort in the home. An EPA adviser also knows exactly which customer may be prepared to invest in his home. Advisers receive income for survey and advice. It amounts to around €160 per EPA. The measures to be taken may also generate income.

If a home owner implements a measure that has been indicated in the advice and which appears on the Dutch Energy Premium scheme list, he will receive reimbursement for this advice. This is subject to a maximum of 160 EUR. There is also a bonus of not less than 25 per cent on top of the Energy Premium that would in any event be allowed for the measure in question. The Energy Premium applies as at 1 January 2000 and has no retrospective effect. The Energy Premium is applicable to the main energy-saving measures in and on the home. They are mainly concerned with insulation and efficient heating. In addition, the building licence must have been issued before 1998.

If the homeowner decides not to implement any measures, there will be a charge for the advice. Each home is in principle eligible for the EPA once only.

3.2.4 Energy Audit Model

An EPA consists of the following elements:
- First the EPA adviser determines the energy use of a home.
- Then the advisor determines which energy-saving measures are possible; for example additional insulation, double-glazing or a new high efficiency boiler.
- The adviser can also work out what the costs are and give an idea of the availability of subsidies.

3.2.5 Training, authorisation and quality control

There is no authorisation of auditors within the EPA. All advisers are however, encouraged to take an EPA course.